CLAIMS

What is claimed is:

1. A method for making a mode decision in video coding, comprising

collecting a first portion of video data;

labeling the first portion of video data with an optimal mode;

identifying a feature of the first portion of video data corresponding to the optimal mode; and

making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video.

2. The method of claim 1, wherein collecting a first portion of video data includes collecting a sample of the video data.

3. The method of claim 1, wherein identifying a feature of the first portion of video data corresponding to the optimal mode includes:

defining at least one training feature vector and its cost relating to a unit of the first portion of video data;

defining a training feature space containing the feature vector; and

partitioning the feature space.

4. The method of claim 3, wherein identifying a feature of the first portion of video data corresponding to the optimal mode further includes:

transforming the feature space; and

constructing a probabilistic model of the feature space.

5. The method of claim 1, wherein making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video includes:

calculating a likelihood ratio for a unit of the second portion of the video using the value of the feature;

selecting a hypothesis for the unit that is believed to be true; and

making the mode decision based on the selected hypothesis.

6. The method of claim 1, wherein the mode decision is selected from the group consisting of an intra-/inter-mode decision and a frame skip/code decision.

7. A method of coding a sequence of video, comprising:

extracting at least one sample unit of the video;

defining at least one training feature vector and an associated cost with the vector for the sample unit;

defining a training feature space associated with the feature vector;

transforming the feature space;

constructing a probabilistic model for the feature space;

calculating a likelihood ratio for a second unit of the video;

selecting a hypothesis that is believed to be true for the second unit of the video;

making a mode decision based on the selected hypothesis; and

coding the second unit of the video using the mode decision.

8. The method of claim 7, wherein the associated cost is associated with the mode decision.

9. The method of claim 7, wherein the mode decision is selected from the group consisting of an intra-/inter-mode decision, a frame type selection decision, and a frame skip/code decision.

10. The method of claim 7, wherein defining a training feature space associated with the feature vector includes associating the training feature vector with a hypothesis that is true for the training feature vector.

11. The method of claim 7, wherein transforming the feature space includes replacing the training feature vector with a plurality of vectors having no height.

12. The method of claim 7, wherein constructing a probabilistic model for the feature space includes constructing a Gaussian model for the feature space using an expectation maximization algorithm.

13. The method of claim 7, wherein selecting a hypothesis that is believed to be true for the second unit of the video includes selecting a hypothesis for which a likelihood ratio associated with the second unit of the video exceeds a threshold.

14. The method of claim 7, wherein making a mode decision based on the selected hypothesis includes making a first mode decision when the selected hypothesis is true and making a second mode decision when another hypothesis is true.

15. A video coding system, comprising:

a video encoder, the video encoder for:

collecting a first portion of video data;

labeling the first portion of video data with an optimal mode;

identifying a feature of the first portion of video data corresponding to the optimal mode; and

making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video; and

a video decoder in communication with the video encoder.

16. A video encoder including a set of instructions which, when executed by the encoder, cause the encoder to:

collect a first portion of video data;

label the first portion of video data with an optimal mode;

identify a feature of the first portion of video data corresponding to the optimal mode; and

make a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video.

17. The encoder of claim 16, wherein the mode decision is selected from the group consisting of an intra-/inter-mode decision, a frame type selection decision, and a frame skip/code decision.

18. An apparatus, comprising:

means for collecting a first portion of video data;

means for labeling the first portion of video data with an optimal mode;

means for identifying a feature of the first portion of video data corresponding to the optimal mode; and

means for making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video.

19. An apparatus, comprising:

means for extracting at least one sample unit of a sequence of video;

means for defining at least one training feature vector and an associated cost with the vector for the sample unit;

means for defining a training feature space associated with the feature vector;

means for transforming the feature space;

means for constructing a probabilistic model for the feature space;

means for calculating a likelihood ratio for a second unit of the video;

means for selecting a hypothesis that is believed to be true for the second unit of the video;

means for making a mode decision based on the selected hypothesis; and

means for coding the second unit of the video using the mode decision.

20. A method of coding a sequence of video, comprising:

extracting at least one sample unit of the video;

defining at least one training feature vector and an associated cost with the vector for the sample unit;

defining a training feature space associated with the feature vector;

transforming the feature space;

constructing a probabilistic model for the feature space;

partitioning the feature space into a plurality of regions;

selecting a hypothesis that is believed to be true for the second unit of the video;

making a mode decision based on the selected hypothesis; and

coding the second unit of the video using the mode decision.